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Working Party on Passive Safety

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Item 12 of the provisional agenda
UN Regulation No. 29 (Cabs of commercial vehicles)

Proposal for Supplement 4 to the 03 series of amendments to UN Regulation No. 29 (Cabs of commercial vehicles)

Submitted by the expert from Germany*

The text reproduced below was prepared by the expert from Germany. It introduces amendments to UN Regulation No. 29 and supersedes ECE/TRANS/WP.29/GRSP/2017/26 as distributed during the sixty-second session of the Working Party on General Safety (GRSP) (ECE/TRANS/WP.29/GRSP/62, para. 20). It is based on informal document GRSP-61-20 distributed during the sixty-first session of GRSP (ECE/TRANS/WP.29/GRSP/61, para. 55). The modifications to the existing text of the UN Regulation are marked in bold for new or strikethrough for deleted characters.

* In accordance with the programme of work of the Inland Transport Committee for 2014–2018 (ECE/TRANS/240, para. 105 and ECE/TRANS/2014/26, programme activity 02.4), the World Forum will develop, harmonize and update UN Regulations in order to enhance the performance of vehicles. The present document is submitted in conformity with that mandate.

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I. Proposal

Paragraph 7, amend to read:

"7. Conformity of production

The conformity of production procedures shall comply with those set out in the Agreement, ~~Appendix 2~~ **(Schedule 1,** E/ECE/TRANS/505/Rev.**3)**, with the following requirements:"

Annex 3 Appendix 1, amend to read:

"Annex 3 - Appendix 1

Instructions for securing vehicles to the test bed

1. ~~Frontal impact~~ **General instructions for securing**

~~Test A shall be applied to a cab mounted on the vehicle in the following way (see figure 1 below).~~

1.1. Measures shall be taken to ensure that the vehicle does not shift appreciably during the test. For this purpose the hand-brake shall be applied, a gear engaged and the front wheels wedged with chocks.

1.~~1~~**2.** Anchoring chains or ropes

Each anchoring chain or rope shall be of steel and shall be capable of withstanding a tractive load of at least 10 tons.

1.~~2~~**3.** Blocking of the chassis frame

The longitudinal members of the chassis frame shall be supported on wooden blocks**, rigid composite blocks and/or adjustable metal brackets** across their full width and over a length of not less than 150 mm. The front edges of the blocks must not be situated forward of the rearmost point of the cab, nor rearward of the mid-point of the wheel base **(see figure 1 below)**. At the manufacturer's request the chassis frame shall be set in the attitude it takes up when loaded.

1.~~3~~**4.** Longitudinal attachment

Rearward movement of the chassis frame shall be limited by chains or ropes A attached to the front of the chassis frame symmetrically in relation to its longitudinal axis, the points of attachment being not less than 600 mm apart. The chains or ropes shall when tensioned form a downward angle of not more than 25° with the horizontal and their projection on a horizontal plane shall form an angle of not more than 10° with the longitudinal axis of the vehicle **(see figure 1 below)**. The chains or ropes may cross one another.

~~1.4. Lateral attachment~~

~~Lateral movement shall be limited by chains or ropes B attached to the chassis frame symmetrically in relation to its longitudinal axis. The points of attachment to the chassis shall be not more than 5 m and not less than 3 m~~

~~from the front of the vehicle. The chains or ropes shall when tensioned form a downward angle of not more than 20° with the horizontal and their projection on a horizontal plane shall form an angle of not less than 25° and not more than 45° with the longitudinal axis of the vehicle.~~

1.5. Tensioning of chains or ropes and rear attachment

For tests A and B, the chain or rope C shall, to begin with, be placed under a load of approximately 1 kN. All slack in the four chains or ropes A and B shall then be taken up and chain or rope C shall be subjected to a tensile stress of not less than 10 kN. The angle of chain or rope C with the horizontal shall not exceed 15°. A vertical blocking force of not less than 500 N shall be applied at point D between the chassis frame and the ground **(see figure 1 below)**. For test C, the chains or ropes B as described above shall be replaced by the chains or ropes E and F **(see figure 2 below)**.

1.6. Equivalent mounting

At the request of the manufacturer the test may be carried out with the cab mounted on a special frame, on condition that this method of mounting is shown to be equivalent to mounting on the vehicle.

2. Frontal impact

2.1. Cab mounted on the vehicle

Test A shall be applied to a cab mounted on the vehicle as described in paragraph 1.

2.1.1. Lateral attachment

Lateral movement shall be limited by chains or ropes B attached to the chassis frame symmetrically in relation to its longitudinal axis. The points of attachment to the chassis shall be not more than 5 m and not less than 3 m from the front of the vehicle. The chains or ropes shall when tensioned form a downward angle of not more than 20° with the horizontal and their projection on a horizontal plane shall form an angle of not less than 25° and not more than 45° with the longitudinal axis of the vehicle (see figure 1 below).

2.2. Cab mounted on a frame

Measures shall be taken to ensure that the cab does not shift appreciably during the test.

~~2~~**3.** Front pillars impact

~~2~~**3.**1. Cab mounted on the vehicle ~~(see fig. 1)~~.

Test B shall be applied to a cab mounted on the vehicle as described in paragraph 1.

~~Measures shall be taken to ensure that the vehicle does not shift appreciably during the test. For this purpose the hand-brake shall be applied, a gear engaged and the front wheels wedged with chocks.~~

3.1.1. Lateral attachment

Lateral movement shall be limited by chains or ropes B attached to the chassis frame symmetrically in relation to its longitudinal axis. The points of attachment to the chassis shall be not more than 5 m and not less than 3 m from the front of the vehicle. The chains or ropes shall

when tensioned form a downward angle of not more than 20° with the horizontal and their projection on a horizontal plane shall form an angle of not less than 25° and not more than 45° with the longitudinal axis of the vehicle (see figure 1 below).

~~2~~3.2. Cab mounted on a frame

Measures shall be taken to ensure that the cab does not shift appreciably during the test.

~~3~~4. Roof strength

~~3~~4.1. Cab mounted on the vehicle

Test C shall be applied to a cab mounted on the vehicle as described in paragraph 1.

~~Measures shall be taken to ensure that the vehicle does not shift appreciably during the test. For this purpose the hand-brake shall be applied, a gear engaged and the front wheels wedged with chocks. Deformation of the various components of the suspension (springs, tyres, etc.) shall be eliminated by means of rigid members.~~

4.1.1. Blocking of the chassis frame

Notwithstanding paragraph 1.3. an additional support shall be placed under both sides of the longitudinal members of the chassis frame's front end.

4.1.2. Lateral attachment

Lateral movement shall be limited by chains or ropes E and F attached to the chassis frame symmetrically in relation to its longitudinal axis.

The points of attachment of chains or rope E to the chassis shall be not more than 5 m and not less than 3 m from the front of the vehicle.

The points of attachment of chains or rope F to the chassis shall be between the centre of the front axle and the front of the vehicle.

The chains or ropes shall when tensioned form a downward angle of not more than 20° with the horizontal and their projection on a horizontal plane shall form an angle 90°±5° with the longitudinal axis of the vehicle (see figure 2 below).

~~3~~4.2. Cab mounted on a frame

Measures shall be taken to ensure that the frame does not shift appreciably during the test.

Figure 1, shall be deleted

Insert new Figures 1 and 2, to read:

Figure 1
Front impact test and front pillars impact test
The cab is mounted on the vehicle

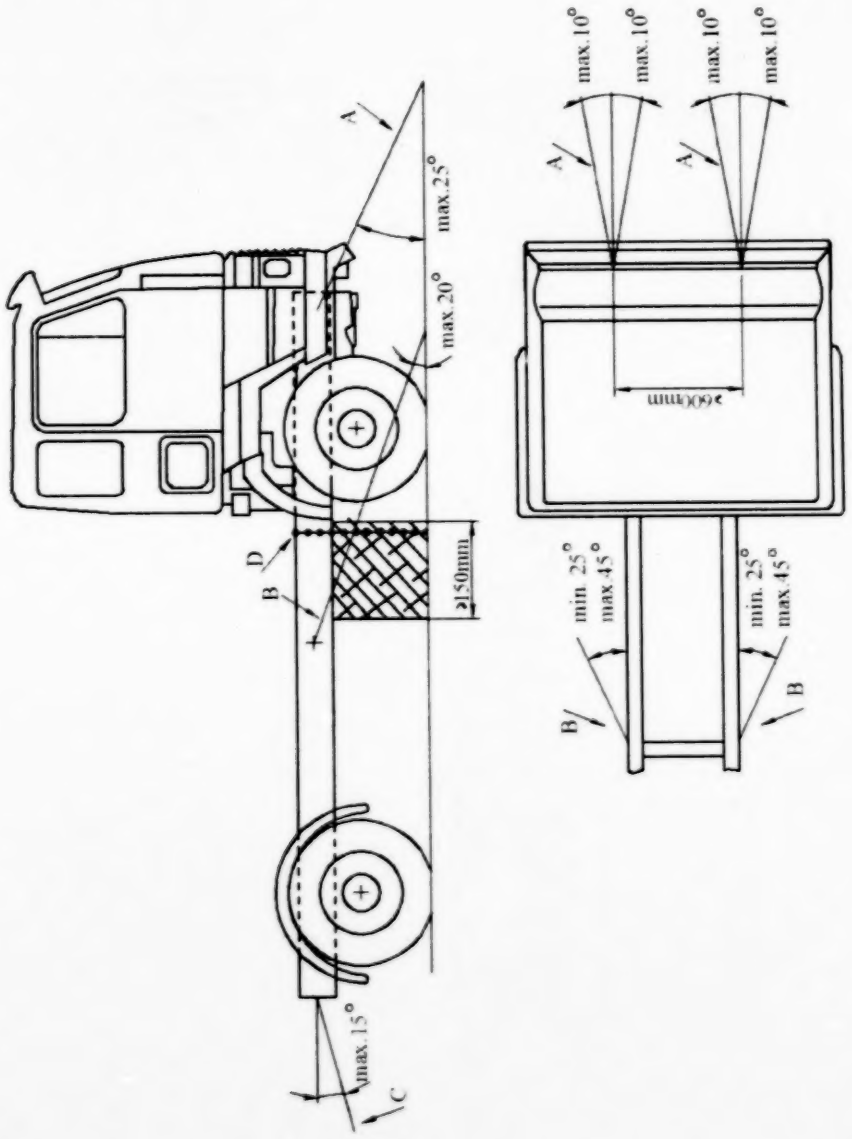
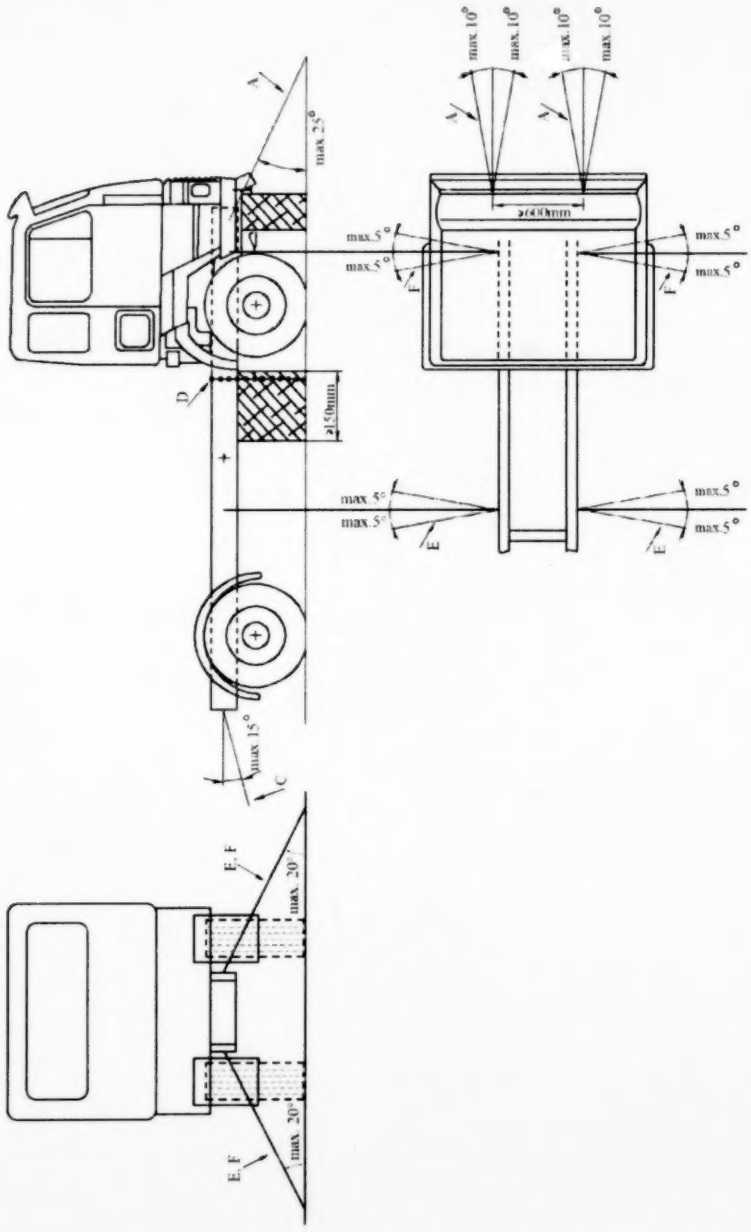


Figure 2
Roof strength test
The cab is mounted on the vehicle



II. Justification

1. Currently test A of UN Regulation No. 29 contains detailed specifications on how to secure a cab mounted on a vehicle on the test rig. The proposed amendments will fill that gap and provide the necessary specifications also for test B and test C to improve the repeatability of the tests.

2. The proposal also allows, instead of the wooden block shown in Figure 1, to use rigid composite blocks and/or (adjustable) metal brackets to make the fixation of the vehicle on the test rig more convenient.

3. For Test C (Roof Strength), ropes/chains B are not required because ropes E and F are instead used for lateral attachment – this is now clarified with updates to paragraph 1.5.

I. Proposal

Paragraph 6.2.12., amend to read:

"6.2.12. In **the** case of ~~booster cushions~~ **non-integral child restraint systems**, the ease with which the straps and tongue of an adult belt pass through the fixture points shall be examined. ~~This goes particularly for booster cushions which are designed for the front seats of cars, which may have long semi-rigid stalks.~~

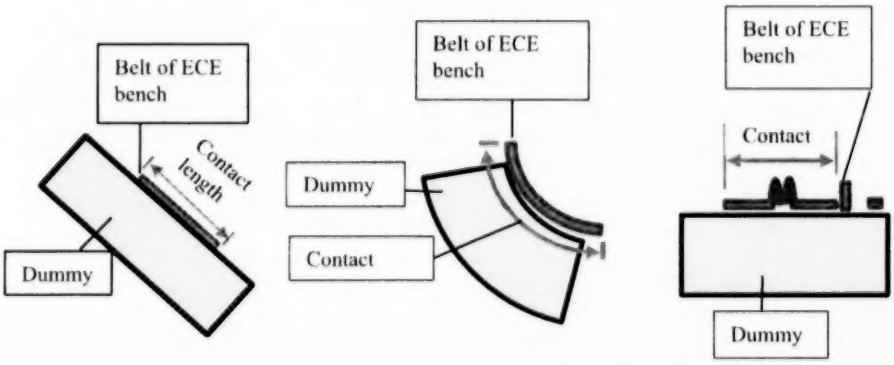
The ~~fixed~~ **simulated** buckle **when installed on the bench, prior to all dynamic tests, shall** ~~should~~ not ~~be allowed~~:

(a) ~~to~~ pass through the fixture points **or belt guides** of ~~booster seats~~ **non-integral child restraint systems, or**

(b) ~~to~~ permit a lie of **the** belt ~~completely different from that of the test-trolley~~ **that leads to any contact narrower than 38 mm between the adult belt or simulated buckle and the child.**

Measurement method:

The width of the contact between the belt and the dummy shall be assessed by measuring the minimum length between the effective sides of the belt. If the belt, as seen in a cross section, takes the shape of a curve, the outside contour of the curve is measured. If the belt in cross section has folds, the contact length is defined from one side to the other side of the belt.



"

Paragraph 9.1., amend to read:

"9.1. The test report shall record the results of all test and measurement including the following test data:

...

(g) The place occupied by the buckle during the tests, ~~if it can be varied~~, **and/or pictures of the simulated buckle in case of testing of non-integral child restraint systems,** and

..."

II. Justification

1. Injury to the human body as a result of strong local pressure shall be prevented. Such injuries can be caused by twisted buckles and belts, and also by twisted tongues.

2. UN Regulation No. 16 set provisions to check injuries caused by narrow contact with buckle and safety-belt (paragraphs. 6.2.2.1. and 6.3.1.1.).

3. During the previous sessions of GRSP, the provisions of UN Regulation No. 44, paragraph 7.2.1.1. had been improved by adding the tongue to prevent these injuries. However, paragraph. 7.2. was eventually intended only for individual components of integral child restraints!

4. Therefore UN Regulation No. 44 should be improved by also checking non-integral child restraints (e.g. booster!).

5. In the previous GRSP session the expert from the Netherlands attempted to improve paragraph. 6.2.12. by means of a generic buckle. However, the above proposal improves the test provisions by using the original Standard Safety-belt of UN Regulation No. 44, which is also better documented in the test report.